

types and a taxonomic presentation of the group, in which *Gnetopsis elliptica* is placed provisionally with *Conostomum* in the "Conostomeae." A brief discussion of the "pollination mechanisms" of the Lagenostomales calls attention to the three distinct types exhibited by the group: that in which the free but approximated lobes of the integument surrounded and overtopped the pollen chamber and probably at pollination formed a funnel (*Phylostoma*); that in which a massive "canopy" was pierced by a long micropyle (*Conostoma*); and that in which the compact canopy closely invested the conical pollen chamber, whose orifice reached to the outer surface (*Lagenostoma*). A glossary is provided at the close of the paper, since such terms as the "blow-off layer," "lagenostome," and "plinth" are not easily separated from the well-worn terms heretofore applied to the same structures.—J. M. C.

Anatomy of Azolla.—QUEVA³⁶ has investigated the vascular anatomy of *Azolla filiculoides*, and has secured some interesting facts. The vascular elements are differentiated in the floating, dorsiventral stem, those of the dorsal region being tracheids of small caliber, and those of the ventral region being vessels of large caliber. The transverse section of the xylem is circular, the circle being incomplete alternately on the right and left sides in the dorsal region; so that the section is really an arc which is open alternately right and left, corresponding to the alternating leaf traces. The heavy vessels of the ventral region are connected exclusively with the roots. The interpretation suggested is that the dorsal group of vessels represents a reduced bipolar group, connected at the poles with leaf traces; and that the ventral group is merely an "apolar" mass related to the roots. The amount of vascular tissue retained would seem to be a remarkable feature in a stem with such an extremely hydrophytic habit.—J. M. C.

Germination of Helianthus.—MILLER³⁷ has studied the transformations of the reserve materials of the sunflower during germination. The work shows both chemical and biological excellence. Main emphasis is put upon the transformation of fats. The fats extracted from the cotyledons show low acid values at all times, while those from the hypocotyl very early, and continuously thereafter, show high acid values. It was not determined whether the fats are translocated as such or as hydrolyzed products. The iodine value of the fats falls as germination advances, due as the author believes to the absorption of oxygen. As germination progresses, the fats decrease rather rapidly, while the carbohydrates increase. This furnishes further evidence for the established view that during germination fats are transformed to carbohydrates.—WILLIAM CROCKER.

³⁶ QUEVA, C., *L'Azolla filiculoides* Lam., étude anatomique. Mém. Soc. Hist. Nat. Autun 23: pp. 24. figs. 22. 1910.

³⁷ MILLER, EDWIN C., A physiological study of the germination of *Helianthus annuus*. Annals of Botany 24: 693-726. 1910.